AMENDMENTS TO THE CLAIMS

1-27. **(Canceled)**

28. **(Currently amended)** A method for producing mutant genes encoding an enzyme, ~~the method~~ comprising:

(a) introducing ~~one or more~~ mutations into individual copies of a gene ~~encoding an enzyme~~ to form a plurality of mutated genes, wherein each mutated gene encodes a mutated enzyme;

(b) providing the mutated genes to host ~~microorganisms~~ bacteria by inserting the mutated genes into vectors and transforming the ~~microorganisms~~ bacteria with the vectors;

(c) culturing the host ~~microorganisms~~ bacteria containing the vectors in the presence of a substrate for the enzyme under conditions suitable for activity of the enzyme such that a ~~microorganism~~ bacterium expressing a functional enzyme from a mutated gene has a detectable characteristic; ~~and~~

(d) ~~obtaining~~ sorting host ~~microorganisms~~ bacteria ~~expressing a functional enzyme~~ having the detectable characteristic by flow cytometry, wherein the host bacteria are sorted without selecting ~~microorganisms on the basis of~~ for an altered or defined level of enzyme activity compared with a corresponding wild type enzyme; and

(e) obtaining a pool of mutated genes encoding functional enzymes from the bacteria in step (d) and repeating steps (a) to (d) to form a library of bacteria containing a plurality of mutant genes expressing a functional enzyme.

29. **(Currently amended)** The method according to claim 28 further comprising:

~~(e)~~ (f) recovering the vectors from the host ~~microorganisms~~ bacteria expressing a functional enzyme.

30. **(Canceled)**

31. **(Currently amended)** The method according to claim ~~30~~ 29 further comprising:

(g) screening the library of ~~microorganisms~~ bacteria to obtain a mutant gene encoding a functional enzyme.

32. **(Previously presented)** The method according to claim 28 wherein step (a) is carried out by mis-incorporation mutagenesis using polymerase chain reaction (PCR) or gene shuffling.

33. **(Currently amended)** The method according to claim 28 wherein the vector is a plasmid or virus ~~and the host microorganism is a bacterium~~.

34. **(Currently amended)** The method according to claim ~~33~~ 28 wherein the bacterium is *Escherichia coli*.

35. **(Currently amended)** The method according to claim ~~33~~ 28 wherein host ~~microorganisms~~ bacteria are cultured in a liquid medium.

36. **(Canceled)**

37. **(Currently amended)** The method according to claim ~~36~~ 28 wherein the enzyme ~~can form~~ forms a fluorometric or chromogenic phenotype or character in the host ~~microorganism~~ bacteria.

38. **(Currently amended)** The method according to claim 37 wherein the host ~~microorganism is~~ bacteria are selected by changes in ~~its~~ their spectral or fluorescence characteristics due to action of the enzyme on the substrate.

39. **(Currently amended)** The method according to claim 38 wherein the enzyme is capable of acting on ~~an X-sugar~~ a 5-bromo-4-chloro-3-indolyl-linked sugar substrate or a fluorescein-linked sugar substrate.

40. **(Currently amended)** The method according to claim 39 wherein the substrate is an ~~indoxyl~~ indolyl-linked compound.

41. **(Currently amended)** The method according to claim 40 wherein the enzyme acting on an ~~indoxyl~~ indolyl -linked substrate is selected from the group consisting of glycosyl hydrolases, cellulases, beta-glucosidases, beta-galactosidases, mannosidases, xylanases, and beta-xylosidases.

42. **(Previously presented)** The method according to claim 41 wherein the enzyme is capable of acting on 5-Bromo-4-chloro-3-indolyl-D-galactopyranoside which forms a chromogen upon enzymatic hydrolysis.

43. **(Currently amended)** The method according to claim 28 wherein the enzyme substrate is retained on[[,]]or within the ~~cell~~ bacteria[[,]] in liquid culture.

44. **(Currently amended)** The method according to claim 28 wherein ~~the host microorganisms are obtained by sorting~~ by the flow cytometry is fluorescence activated cell sorting (FACS).

45. **(Canceled)**

46. **(Canceled)**